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HR Contribution to IT Innovation Implementation: Results of Three Case Studies

The theoretical and empirical investigation of information technologies (IT) innovation implementations reveals that they lack conceptual and practical support from HRM professionals. The HRM practices undertaken by HR professionals are not even discussed. We argue that HR departments should contribute to IT innovation projects by being responsible for explicitly defining job tasks that have to be automated, establishing a rewards system for those who have to learn and use a new technology, and analyzing the training needs of the users and providing them with adequate training. HRM should more actively intervene in IT innovation projects. Such intervention would, we believe, foster compatibility between the prior intentions of information technology, the strategies and practices, the individual users' needs in it, and the adoption of IT by the users.

Introduction

IT innovation implementations are widely acknowledged as turbulent and conflicting developments in organisations that demand the implementation of different technical and social changes. When we look at a live IT innovation project, it is apparent that a project team has to deal with various complicating circumstances surrounding IT innovation including: budget limitations, political games inside a company, agreements with a consultancy firm, availability of resources, reallocating of resources, job tasks analysis, and existing technological infrastructure (Martinez, 1994; Klein and Sorra, 1996; Segars et al, 1998; Gottschalk, 1999). At the same time it is clear that IT project teams mainly consist of IT professionals with a technical background but without input from the HRM side.

In this article we aim to define the IT managerial practices that in our view should be performed by HR professionals during IT innovation implementation projects.

In order to achieve that, we first discuss HRM literature that emphasises practices for technical innovation, and IT literature that focuses on HRM practices.

The literature review allows us to propose HR practices that could contribute to IT innovation implementation projects. To showcase the reality of the HRM contribution in IT projects, we provide the findings from three case studies conducted in Dutch organizations that once manifested IT innovation strategies and introduced new information technologies to their employees. The case studies were conducted as investigations into IT innovations implementation. However, their findings have revealed broader insights on the managerial support issues including HRM practices during the IT projects.

HRM Practices for IT Innovation

In this article we are interested in the question of which HR practices promote IT innovation in a company. We will look at this from two perspectives: HRM studies and IT studies.

HRM Literature about IT Innovation

At the beginning of the 1990s, a series of research studies conducted in the field of the HRM roles in technical innovation (Legge, 1993; Preece, 1993; Bessant, 1993; Clark, 1993) stressed the importance of strategic HR functioning: “if we view strategic behaviour not as a discrete decision but as an incremental process of decision-making and adaptation over time and space, there is some evidence that HR issues may play an important role in the management of technical change that might appear at first sight” (Clark, 1993, p. 215).

The empirical research done in the beginning of the 1990s (Clark, 1993) has pointed to the most essential personnel issues in the introduction of technical change, irrespective of

whether it is personnel specialists, non-specialists with responsibilities for personnel issues, or line managers who are the champions of these issues. They could be grouped into three main types:

- work structuring,
- organisation design, and
- personnel issues in the narrow sense.

Regarding work structuring, changes in supervision, the creation of semi-autonomous teams – these were underestimated, and the organisations subsequently introduced limitations in allowing staff to play to their strengths (p. 216). Concerning organisation design issues, the three most important trends were observed as the breakdown of traditional departmental boundaries, delayering and "lean" staffing levels, and quality which was intended to improve. Further, Clark (1993) observed that the four usual, narrow HRM issues (selection, appraisal, reward, and development) got the most attention in organisations during technological change and were even regarded as true hallmarks of strategic HRM. At the same time it was also noticed that those narrow HRM issues were highly prominent factors in the management of advanced technical change. Of the four issues, however, selection of the appropriate staff was a particular priority in organisations, as was the training and development of staff to work with the new technology.

Later, discussing the role of HR in promoting technological innovation, Chung (1997) addressed specific tools and practices. He proposed the following issues:

- The first is the use of a human-centred technological philosophy aiming to support workers whose basic skills are leveraged by advanced manufacturing technology.
- The second issue concerns the presence of a technological champion, a high-level management individual who is knowledgeable about the new technology and provides continuous support for it. Research has shown a higher impact of the technological champion during the start-up phase than during the planning and installation phases.

- The next issue is worker involvement in planning. This has been shown to have a higher influence in the planning phase of technology introduction than in the conceptual phase on the use of new technology.
- The fourth issue is the use of pilot-level technological projects that allow for the gradual introduction of the technology. Research confirms that it also permits employees involved in the pilots to train other workers.
- Reorganisation of the workforce is the fifth HR issue; it involves reconsideration and reassignment of the job tasks and allows more integrated work teams.
- The last issue is the empowerment of the technological workers. This consists of changing the decision-making level to the lowest level supported by the information generated by the technology. However, empirical research has shown that worker empowerment at the early start-up stage of the technology introduction could have potentially negative results because of a still unstable manufacturing system. Only after the system had passed through the start-up phase and was fully debugged would worker empowerment provide benefit (Chung, 1997).

Three concluding remarks are worth mentioning here:

- Research has already distinguished several HR practices that are valuable during technological innovations, for example, the presence of a technological champion, worker involvement in planning, and empowerment of the users of a technological innovation. However, these and other practices are yet not embedded in the holistic complexity of technological innovation implementations in such projects.
- Most attention is paid to the narrow HRM instruments at the individual level like selection, appraisal, rewards, and development, while HR practices at the group and organisational levels are less addressed. Work restructuring and organisational (re)design issues remain as theoretical constructs and are not fully involved in the reality of IT innovations, and therefore HRM is still not utilising its strategic possibilities.

- While discussing HR practices for technological innovation, the literature does not cover specialities of IT innovations. One could derive recommendations and 'translate' general HR practices for an IT innovation. However, we believe such a simplistic approach would not take into consideration the specialities of information technologies. For example, if we follow the usual advice to select capable workers, this could be interpreted as looking for employees who have advanced software experience. However, studies in the IT field show that software experience does not ensure successful use of a new IT by the employees. Or IT research shows that users' involvement in IT innovation is not enough only at the planning and introduction stages of IT projects but should be addressed until project completion. However, this aspect is not tackled in the HR literature on IT innovations.

IT Literature about HRM Practices

A review of the relevant IT literature has yielded a wide range of managerial practices and practices that could support IT innovations. For example, a comprehensive review done by Sauer (1999) has revealed 12 so-called factor classes that were dominant in the IT literature as potential causes of failure if ignored: User involvement, Management commitment, Value basis, Mutual understanding, Design quality, Performance level, Project management, Resource adequacy, Situational stability, Management process, Implementation process, and Individual differences.

The work of Sauer (1999) supports three important notes. First, many IT studies focus on only one or two factor classes and overlook the multifaceted integrated managerial support needed in IT implementation. Second, it is not clear who is responsible for undertaking those practices. And third, it is not clear what is the basis on which one should select those practices.

One of the closest research scholars to HRM issues in the IT field is the so-called Computer Personnel Research (CPR) that has been publishing studies on work and workers since the 1960-s (overviews are available in Jordan and Whiteley, 1994; Ambrose et al, 1998; Schell, 1998; Niederman and Mandviwalla, 2004). This research focuses on the human issues related to the MIS professionals and end users, "that are critical in the development, acquisition, management, use, and maintenance of information technologies" (Niederman and Moore, 2000, p. 68). Analysis of 300 papers published in the CPR proceedings within 9 years has revealed 16 topics associated with HRM practices: job analysis, job attitudes, training and development, performance, individual differences, managing and coaching, workplace design, careers, recruitment and selection, communication, retention, organisational structure, workplace ethics, compensation, decision making, and stress/burnout (listed as from the most frequently to least frequently investigated) (Niederman and Moore, 2000). Authors' conclusions are worth to quote for this article:

> "As a rule, CPR researchers don't seem to have begun by working from these categories and frankly don't seem much concerned with HR/OB classifications… This represents strength of the CPR literature that has emphasized pragmatic issues… It also implies that this literature may have a major contribution to the HR literature by moving from historic categorization to new more technology concerned issues" (Niederman and Moore, 2000, p. 73).

To summarise, we should say that the IT literature does recognize the importance of HR issues. And it shows at least three tendencies:

- The IT literature has pointed those HR issues that are probably the most relevant for IT. There is a definite value, for example, in developing HR knowledge about design of new IT jobs like network specialists, chief information officers, help-desk respondent, or system analyst or another value for HR is IT studies on the fit between organisational commitment and technology preferences. However, the IT literature fails to look at the HR practices systematically, giving self-excuse for this

as ‘finding the most pragmatic and relevant practices’ and ignoring historical HRM models.

- The IT articles mix different approaches to and strategies for the managerial issues in IT innovation implementations. Although such a mix might contain insightful recommendations and guidelines, the studies only cover a great range of diverse managerial practices and do not specify them in detail.
- The studies propose and/or investigate managerial activities that in our view should be undertaken by different professionals: for example, technical piloting of IT by technical experts; project budgeting by a project team; adequate training by both IT and HR specialists; task reassignment, employing a new reward system by HR specialists; requirements analysis by IT professionals. However, the literature on IT implementation does not specify the professionals responsible for undertaking those activities, rather it implicitly attributes them to the information system specialists or to the project teams that are in practice mainly composed of technical people.

We think that it is sensible to keep many IT project activities in the hands of software specialists, but it is also wise to make at least three adjustments. First, we disagree with the opinion that the pragmatic approach in searching HR practices is the most fruitful for IT projects. Ignoring a systematic HRM approach would mean ignoring a complex nature of social and human aspects involved in IT projects. Why, for example, to concentrate on training skills and not – on compensation policies or work time re-scheduling? Choices for certain HR practices, or “people issues” in IT projects should have a systematic basis where those practices are interrelated and only *jointly* contribute to the development and maintenance of IT. Second, as we mentioned earlier, IT managers deal with a great range of activities during the IT projects, including financial, technical, HR and other aspects. Therefore, we propose that HR activities can be done with the help of HRM professionals.

Third, we should indicate to what extent these practices should intervene in an IT innovation. The next section presents our view.

HR Contribution to IT Innovation Projects

Managerial support for an IT innovation could be defined as management decisions and activities aimed at encouraging use of the IT innovation by the targeted employees (Klein and Sorra, 1996). Within such a broad framework, we define HRM practices as ***the HR tools that affect the employment relationship during/because of the introduction of a new IT, and try to develop activities to improve those relationships*** (De Leede et al, 1999).

In order to operationalise this definition, we have chosen the concept of HRM innovation (Looise and Van Riemsdijk, 2004), where HRM is viewed as a four-set concept including:

- new organization and job design
- new forms of human resource flow
- new forms of performance and reward, and
- new forms of communication and participation.

New organization and job design in the technological innovation process is related to the analysis and (re)assignment of the tasks to be automated by a new IT. New forms of human resource flow are associated with the resourcing of the organization by managing inflow, through flow and outflow of personnel in a new technological work situation. The reward system is to be adapted to the technological change in a company through introducing new pay systems, appraisal and job evaluation. And finally, new forms of communication and participation are likely to achieve intensive employee participation in the IT project and new ways of informing them.

Table 1 provides an overview of the HR practices that we think should be led by HR professionals during IT projects. It is worth emphasizing that we are discussing the HR practices that contribute to the management of IT innovation projects but cannot be

considered as a panacea for the IT project's success. In other words, they should be combined with the other managerial issues in the projects like providing an adequate IT infrastructure, measuring technical performance, requirements engineering, and maintaining functional administration of technology.

Table 1 is about here

Research Methods

We conducted three case studies in Dutch organisations where new IT were introduced. The case studies lasted 6-10 months and aimed at obtaining knowledge about the implementation of IT. However, the rich qualitative data allowed us to raise questions about the HR support during the projects.

Overall, in the three case studies, we conducted a total of 83 interviews. Ninety employees were interviewed (there were some group-based interviews) as follows:

- 11 managerial employees responsible for strategic policy-making in the companies and for selecting the information system.
- 10 members of the project teams involved in steering the technology implementation, who provided support for end-users, performed help-desk duties, maintained the functional and technical administration of the system.
- 67 end-users of the systems, who had to work with the newly introduced IT on a daily basis.
- 2 people responsible for the technical administration of the systems.

Case Study 1: Beaufort Project

The first case study was conducted in Medinet, a large regional hospital in the Netherlands. The focus of our research was the users of the new information technology Beaufort that was introduced in September 2000 to the personnel and salary department

(PSA), and in May 2001 to the local HR managers from four departments, who became the decentralized users of the system.

A new information system Beaufort aimed to increase the efficiency of personnel administration by restructuring the HRM processes: the decentralised users were expected to directly carry out data processing using the system. The idea was that local managers should input the personnel data straight into the system and could share that information across departments.

The project resulted in two opposite situations: the PSA department implemented Beaufort effectively, efficiently, and in accordance with the initial plan; the introduction of the same system to the personnel specialists in other departments failed, which led to the blocking of the whole project in October-November 2001.

Case Study 2: KennisNet Project

The second case study was conducted in InsurOrg, an insurance company in the Netherlands. The digital knowledge network – KennisNet – was introduced in October 2001 to the non-life insurance product managers. One of the goals of the system was to provide technical support for creating, gathering, and disseminating professional information among the non-life-insurance specialists in five remote locations.

Product managers' tasks were related to knowledge management within a certain non-life-insurance product. In particular, these included: analysis of the market, qualitative analysis of the results, new product development, and knowledge monitoring – all related to the terms, policies, and changes in non-life-insurance products.

Despite the users' interest and need of such a system at the beginning, the targeted employees did not work with it already two months after its introduction, and the project appeared to be almost beyond hope.

Case study 3: SAP_HR project

Our third case study was conducted in a large Dutch University. The focus of the research was personnel and salary administrators – the users of a new information technology, SAP_HR, that was introduced in January 2002.

HR administrative tasks had to be performed through SAP_HR, including for example appointment of an employee, modification of basic information, payment information, working time registration, relocation processing, promotion, administration of leave (sabbatical, sick, parental), and making HR statistical reports.

One of the main forces for the organisation to decide to introduce a new personnel system was the necessity to replace an old personnel management technology because the contract with its supplier was about to expire.

The users struggled with the system for first eight months trying to resolve numerous difficulties in working with SAP, and even to slow down the implementation project. However, the pressure from the 'top' gave no other choice to the employees than to fight on with *mySAP HR.* After one year the use of the technology became easier although not without difficulties.

Findings

HR practices affecting the Beaufort project

The Beaufort project was managed and led by the project team consisting of 4 members, 3 of them had software experience in other IT projects in Medinet, and 1 was appointed to be responsible for the training of the users. None of the project team members was specialized in HR work.

New job tasks that had to be automated were not defined and operationalised. When the decentralized users began to use Beaufort, this presented a big obstacle. They stressed that

time registration and sick leave administration were just minor administrative responsibilities among their HR work, but the system forced them to pay too much attention to these tasks.

The way of working also became more complex for the decentralized users. They had to duplicate their inputs: they did this electronically for the PSA to check, and in the old way on paper.

> "Currently we have to multiply the personnel information three times: we are still working with our own system, we have to learn Beaufort, and there is a need to keep on with the paperwork in order to check if the information is correct" (Tom, local manager).

There were many differing learning opportunities arranged for the PSA employees. Six of them (out of 18) followed three- to four-day software courses at a supplier location followed by a special didactical course in June-July 2000. This group became the core for peer teaching within the department. Instructions were provided for all PSA members by their colleagues and by experts. There was a separate three- to five-hour training session for each Beaufort module. The learning possibilities for the decentralized users were different. Only one of them attended the Beaufort course, and she was expected to teach the others how to operate the system. For the other decentralized users, the major source of information about Beaufort was a one-hour instruction session provided by one of the PSA specialists.

The employees were not rewarded or given recognition for their efforts invested in learning the new system. Comments from the project team on their use of, or learning, the system took place only in the event of negative emergencies.

HR practices affecting the KennisNet project

The KennisNet project was managed and led by the project team, consisting of 6 members, among them the project leader who had an IT background and 5 other persons who formed the non-life-insurance centre in the company. The KennisNet project was for them one of many other activities. None of them was specialized in HR work.

Product managers in five locations had slightly different tasks' content due to the differing backgrounds of the group members - they were representatives of former competitors - and by the diversity of performance logistics, work rules, and traditions. As a result, the employees faced such questions as with whom to share knowledge, whom to ask for advice, and what information to share. There was the necessity of having information 'right now', without any delay. Hence telephone and e-mail technology, or even face-to-face talks, were perceived as more supportive.

Before KennisNet was introduced, there was a workshop in which the specifications and functionalities of the system were introduced and clarified. The majority of the employees perceived this as sufficient and clear, although some of them noted that it was "not very intensive" and "could be better". We found that some of them did not even remember this had occurred:

> "As an introduction, I had two hours of instruction. It could have been better, I must say. I realise that better instructions and education would have helped more" (Joost, product manager).

In a manual on how to work with KennisNet there was no description of the work situations in which it would be wise to use KennisNet (and its various items), of targeted groups of users and their information needs covered by the system, rules and recommendations on how to work with it (what to input, and when), and so on.

The employees were free to choose whether to use it or not, when to use the technology and for what purposes. However, some of the users noted that at the beginning there was one rule: all documents must be sent to the managers who would then make the inputs into the system. The managers stressed the voluntary basis of the use of KennisNet.

HR practices affecting the SAP_HR project

The SAP_HR project was managed and led by the functional administration of the technology, consisting of 5 members, all with an IT background. The leader of the project was a representative of an external consultancy firm specializing in SAP technologies.

After SAP_HR went live, the users discovered that some options in the system became useless: registration of the train card details, subscriptions, and full information about children of the University employees.

The employees expressed that they were not given opportunities to learn and practice with SAP_HR, as all their usual tasks still had to be done.

> "At the beginning I tried to practice with the system, but there was nobody around of whom I could ask a question and get fruitful help. In fact, it was even impossible to practice! I felt that I was cut off from my work – I was blocked" (Betsy, personnel administrator).

Before SAP_HR was introduced, there was a course about the system, provided by the consultants. Interviewees were all of the opinion that this was not sufficient and did not provide any idea about using SAP_HR:

> "During the first day of the course they explained to us how to click the buttons, but it was too simplistic. The second day was a bit better - about the administration of basic employee appointments. But, in reality, all the appointments include so many special details and different personal situations that when I came to do the work, I felt lost with my limited knowledge from the course" (Marijke, personnel administrator).

In all units, during the departmental meetings they discussed "bad" cases in the use of SAP_HR – i.e. when employees did not get their salaries. Reward schemes did not exist. In the units, the heads of the departments financially rewarded users for their troubles with SAP_HR on their own initiative.

Discussion

In this article we have proposed that some managerial practices during IT innovation projects require professional HR attention and should therefore be performed with the participation of HR specialists. We call this an HRM contribution to the IT innovation projects, emphasizing that those practices should be harmoniously combined with other project practices. We have defined the HRM practices in IT innovation implementations as the HR tools that affect the employment relationship during/because of the introduction of a new IT, and try to develop activities to improve those relationships.

The importance of human and organisational issues in IT implementations is widely recognised in the research agenda. Many researchers indicate the priority of the social aspects in IT projects (Child & Loveridge, 1990; De Witte & Steijn, 2000; Orlikowski, 2000; Markus, 2004). HRM contribution as viewed in this paper should be considered as further elaboration on the social and organisational aspects of IT innovations implementations.

In the theoretical discussion we have shown the split between two literatures, IT and HRM, related to the human issues in IT projects. Both literatures do have valuable findings for each other. For example, IT research could benefit if considers a systematic HRM approach, and HR research could gain a lot from concrete technologically-oriented practices investigated in the computer world.

In the three case studies we conducted, the companies manifested IT innovation projects, i.e. new information technologies were introduced to the employees. To start with, we should acknowledge the enormous work done by the IT project teams in all case studies to get the technologies running: collaboration with consultants, maintenance of the technologies, sustaining organisational IT infrastructures, budgeting of the projects, providing training to the users, organising evaluation sessions, etc.

At the same time we saw that all the project teams were composed of IT professionals. We did not see any participation by HR specialists in those projects. To put it even more

explicitly: we did not observe that the needs in professional HR advice/support/participation were analysed. Project leaders did all the managerial routines themselves, including typical HR activities like training needs analysis (if any), providing the users with instructions, restructuring of an organisation's units, and reassignment of the job tasks (if any). A brief summary of the findings is given in table 2.

Table 2 is about here

Observations showed that all the case studies failed to operationalise the job tasks to be automated. We did not see explicit definitions of the tasks and new responsibilities including the boundaries of operations with the employees' technology. All users mentioned the shortage of time given to them to practise with and learn the system, i.e. the working time was not re-scheduled and adapted to a new working situation. Although the new technologies required group re-structuring in InsurOrg and University, we did not find that team work was (re)established.

None of the case studies displayed a special recruitment policy with a focus on the new technologies. The project leaders were not even empowered to hire IT-capable specialists. The PSA employees received effective instructions and other learning sources, including time allocated to practise with Beaufort. The decentralised users were left on their own to cope with their huge problems in operating Beaufort and the consequential negative attitudes towards the system. The training for the KennisNet users became what we characterise as very uncaring: one official workshop with instructions for the whole group, one introductory e-mail message to everybody from the project leader, and a distributed manual also composed by the project leader. In the University, training sessions were far removed from the reality of the personnel and salary tasks, and were mostly oriented towards technical functionalities. They were all provided by an external consultancy firm and included a standard three-day programme. Lack of clarity and uncertainty about the use of SAP_HR forced the users to design their own manuals, sub-manuals, and short e-mail instructions.

This makes us think that only 'customised', user-centred learning opportunities lead to an improvement in the users accepting the system. In our view, users do not need the standard technical manuals that resemble telephone books. Rather, the users need task-based, job-related manuals on *why*, *when*, and *how* they should use the various services in the system. The same holds true for the standardised instruction sessions often provided to the users long before they actually work with the system. Training should be designed on the basis of the users' concrete tasks, with examples from their own work situations, with a possibility to provide it just-in-time when they are required to complete a task.

Another observation based both on theoretical discussion and case studies, is that HR and IT professionals still speak 'different languages'. Finding the common sense would benefit both parties. However, in order to be effective, HRM professionals probably should have competencies to deliver and elaborate on this message, and further – to work the common language out.

Based on these observations, we think that the HR professionals 'missed their chance' to encourage employees, to affect the nature of the relationship between organisations and their 'human resources', i.e. to be more strategically oriented. We propose that HRM should more actively intervene in IT innovation projects. Such intervention would, we believe, foster compatibility between the prior intentions of information technology, the strategies and practices, the individual users' needs in it, and the adoption of IT by the users.

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